

STUDIES IN PYCNOGONIDA, I

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In all our collecting but twenty-two pycnogonids were taken, twenty of which belong to the same species and one of the others to a different species of the same genus. The commonest had a spread of legs of about three-fourths of an inch, while the other species was about three times as large. The latter were so nearly the color of the fuens on which they lived and so covered with debris that it is possible that they may be much more numerous than the number taken would indicate. In working out this report I am indebted to Dr. Leon J. Cole for many kind suggestions and much valuable assistance. I have described the species found as follows:

Anoplodactylus californicus n. sp.

(Figure 49)

Body rather short, lateral processes about as long as their own diameter, radiate, with bases contiguous. First two intersegmental lines barely visible. Proboscis cylindrical with rounded end, almost as long as the length of the body. Diameter of the proboscis one-half its length. Eyes not apparent, but a large conical eye tubercle (bent to the right in the cut as is also the abdomen) arises from the anterior edge of the body which projects over nearly the first half of the proboscis. The abdomen is much the same shape as the last joint of a man's middle finger and, like the eye tubercle is deeply and closely pitted. The rest of the body is pitted but less deeply. Cheliforms large with well developed chelæ and stout shaft, the whole reaching about half their length in front of the proboscis. (In my specimen the chelæ are extended straight in front but there seems to be no reason why they might not be bent in front of the proboscis.) A few short spines on the chelæ; basal joints grown together and apparently supporting the eye tubercle. Palpi and ovigerous legs very rudimentary and wholly within the body (see plate for details). The legs are rather long but stout, sparsely set with short spines. First coxa shorter than its diameter, second coxa over twice the length of the first and enlarged at its distal end, third coxa one and one-half times the length of the first. Femur longer than the combined length of the coxæ. Tibial joints each about three-fourths the length of the femur. All joints of the legs stout. Tarsus about one-half the length of tibial joints; claw two-thirds the length of tarsus

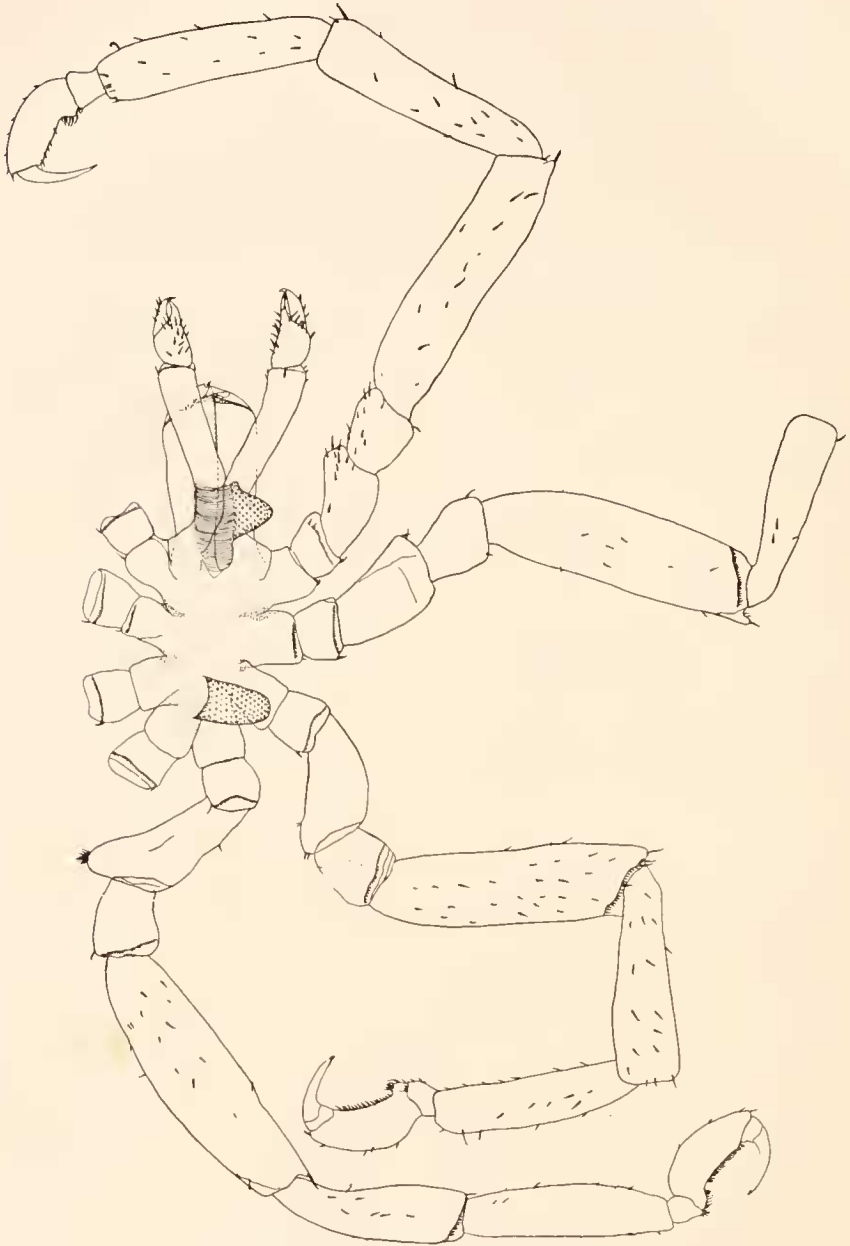


Figure 49. *Anoplodactylus californicus*

and folding down to rows of fine hairs. Auxiliary claws very small. Genital openings not apparent. Color straw. Measurements in mm. Proboscis 1.424; body (from anterior edge to insertion of abdomen) 1.5; leg (approximately) 8; diameter of lateral (leg-bearing) processes .428.

This specimen was swept from fucus at low tide and was put in a bottle with a small nudibranch mollusk which we caught about the same time. About half an hour later we discovered this pyenogonid greedily feeding on the nudibranch. This is of special interest as very little is known of the feeding habits of these interesting creatures.

This species bears a superficial resemblance to *Pallenopsis*, however it differs from that genus in the following respects, i. e.: The abdomen is neither long nor slender, there are no eyes apparent, and the ovigerous legs, instead of being ten-jointed and present in both sexes, are in my specimen reduced to the merest rudiments and are within the body wall so that externally they do not show. On the other hand it is not a typical *Anoplodactylus*, the body being more compact than is usual in that genus, though not nearly so compact as that of *A. anarthrus* (Loman).

***Ammothella bi-unguiculata* var. *californica* n. var.**

(Figure 50)

Body distinctly segmented, leg-bearing processes moderately separated and moderately developed. Their length is about one-half their diameter. Intersegmental lines all distinct. Proboscis slim, spindle shaped; in length two and one-half times the diameter, and four-thirds the length of the body; ending in front with a rounded obtuse angle as seen from above. Four eyes in pairs on a very low eye tubercle; well pigmented. Abdomen small, cylindrical, less than one-fourth the length of the body, with bluntly rounded tip. Anus in notch at the tip. Chelifores short, one-sixth the length of the proboscis, three-jointed; chelæ undeveloped; first joint very short, shaft not quite as long as terminal joint which is nearly spherical. Diameter of chelifores slightly less than that of the palpi. Palpi nine-jointed; as long as the proboscis. First joint short and thicker than the others. Second joint four times as long as the third; fourth joint almost as long as the second; fifth and sixth joints about the same length as the third. Terminal joints decrease in order. Very few hairs on the palpus except on the terminal joint. Ovigerous legs slightly longer and with slightly greater diameter than the palpi. The ten joints named in the order of their lengths (except the first which is short and much thicker than the rest) are, 4, 2, 5, 6, 3, 7, 8, 9, 10. The terminal joints are spirally rolled and on the tip of the

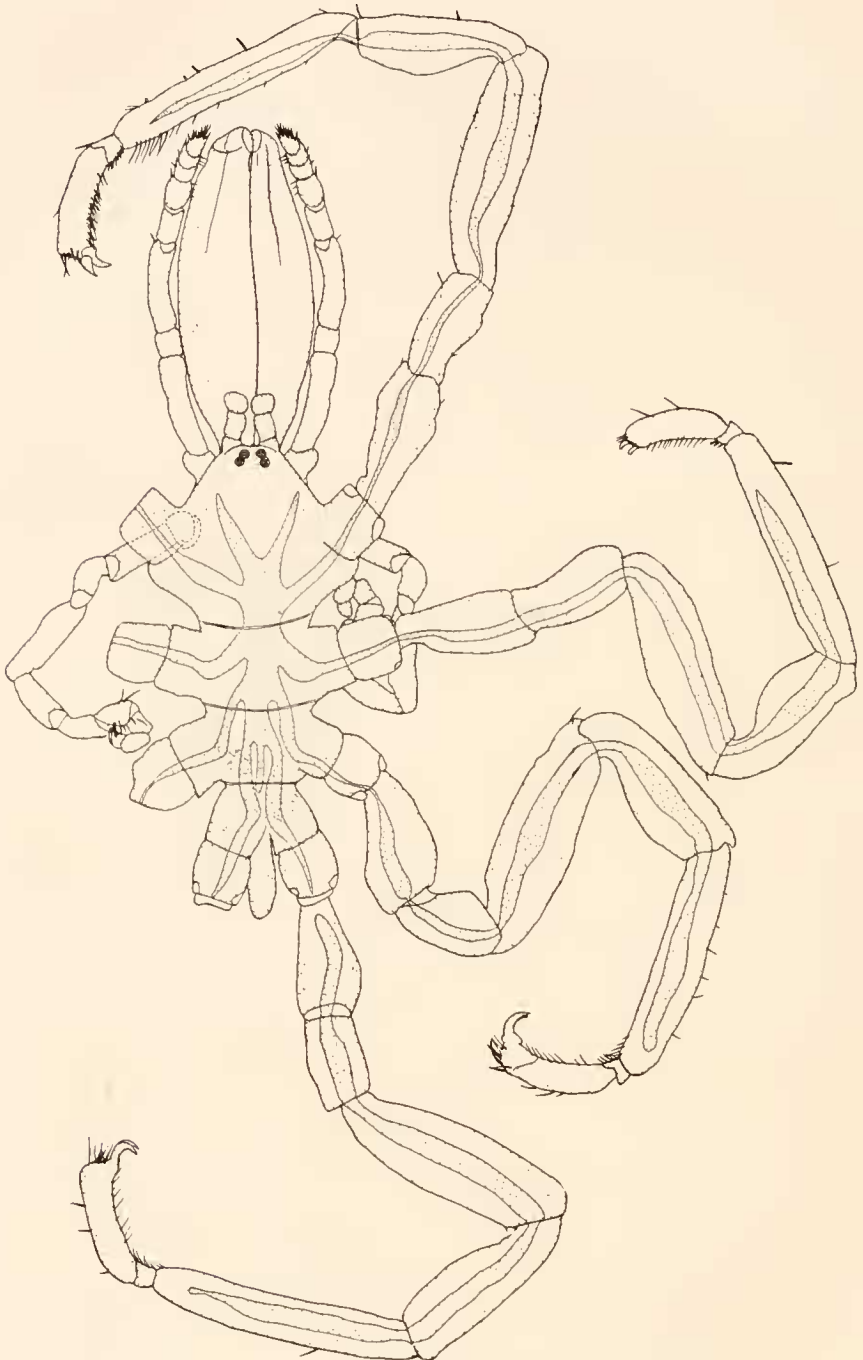


Figure 50. *Ammothella bi-unguiculata* var. *californica*

last are three stiffly plumose hairs. A similar hair is placed on each side of the eighth joint. Legs rather long but stout, no tibial processes, very few hairs except in double row on tarsus. First coxa as long as its own diameter; second twice as long; third coxa one and one-half times the length of the first. Femur about as long as the combined length of the second and third coxæ. Second tibial joint about the same length as femur; first tibial joint slightly shorter. Tarsus is less than one-half as long as second tibial joint. Tarsus has a double row of fine hairs down the "sole" and a few slightly longer hairs on the end. Terminal claw is lacking, while the auxiliary claws are unusually developed. Color light brown; the food was slightly darker making it easy to trace the branches of the stomach into the legs as shown in cut. Measurements in mm. Body 1.3; proboscis 1.05; abdomen .36; leg 4.2; diameter of leg-bearing processes .214.

About twenty specimens of this species were found under stones at low tide, well down toward low water mark. The males bore on their ovigerous legs bunches of dark colored eggs.

As pointed out to me by Dr. Cole, this species agrees closely with *A. bi-unguiculata* (Dohrn). As he says, "if we make the proper allowance for his specimen being an immature one" this specimen "agrees in detail with Dohrn's description." But to say that I had found in California the mature form of Dohrn's Naples species (described, as it was from an immature specimen), would be too much of a guess without comparing mature forms from both localities. This difference of location, the fact of Dohrn's specimen being immature, and the desire not to duplicate names, have led me to describe mine as a *variety* of *A. bi-unguiculata*.

Ammothella spinosissima n. sp.

(Figure 51)

Body with leg-bearing processes almost circular in outline. These processes are grown together for nearly their whole length, and at their distal ends are situated large tufts of spines. No intersegmental lines, but on the back, between the second pair of legs, is a longitudinal row of three large upright spine-covered, finger-like processes. (Bent to the side in the cut as are also the eye tubercle and the abdomen). Proboscis shorter than the apparent length of the body, but if compared with the length of the body from the anterior margin to the base of the abdomen the reverse is true. This is owing to the abdomen being inserted between the last pair of leg-bearing processes which are the only two that are separated. The proboscis is bluntly rounded in front with a notch at the tip; its diameter is about half its length. Four eyes, not conspicuously pig-

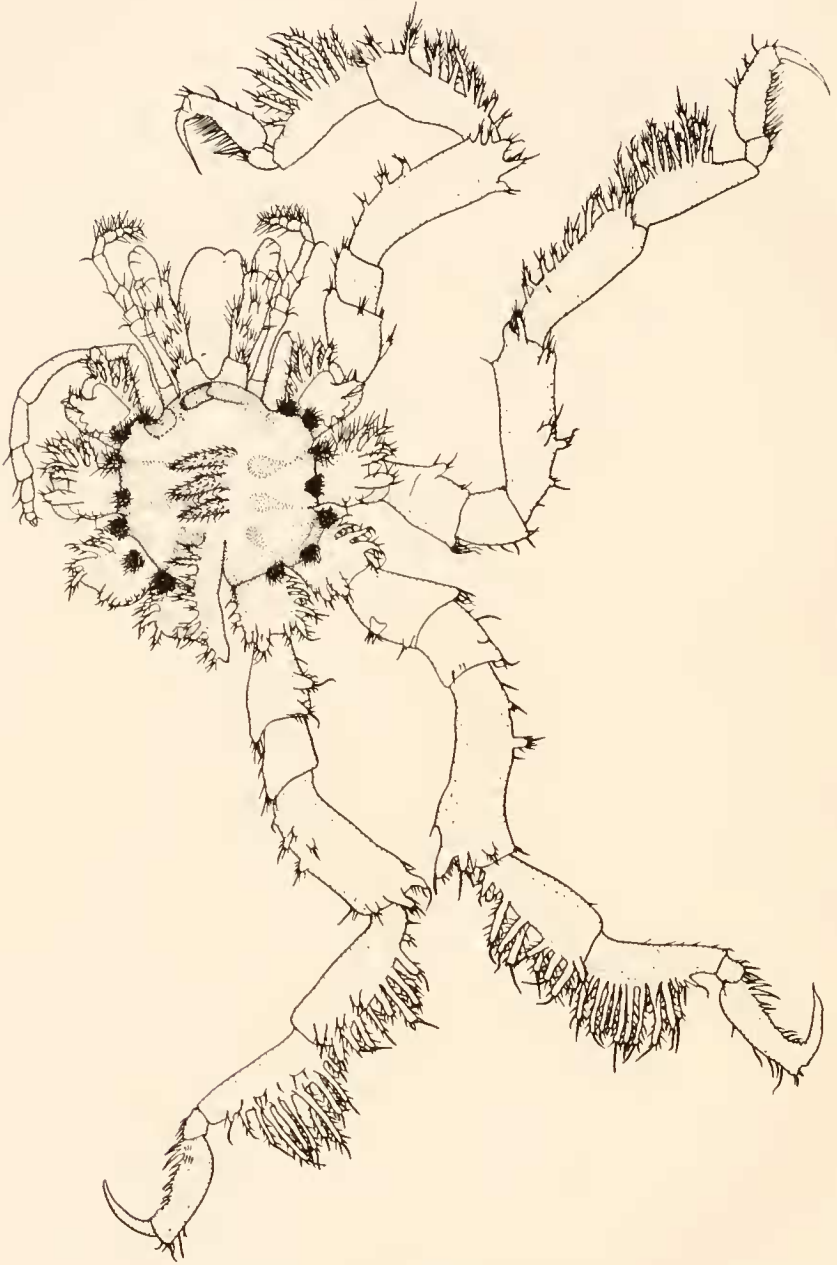


Figure 51. *Ammothella spinosissima*

mented, situated at the top of a relatively small eye-tubercle, the length of which is about twice its diameter. The abdomen is about three-fourths the length of the body, (the latter measured from the anterior margin to the base of the abdomen). Along the top of the abdomen is a row of finger-like, multi-spine-bearing processes similar to those on the legs to which I will refer shortly, but much smaller than the three large ones previously mentioned as on the back. The diameter of the abdomen is about one-fifth its length. The chelifores are stout and slightly surpass the proboscis in length; they are rudimentary in having the chelæ undeveloped. The shaft is set with quite a few multi-spine bearing processes. The basal segment is about the same size as the terminal segment, but the shaft is one and one-half times as long as their combined lengths. The palpi are nine-jointed, surpassing the end of the proboscis by one-third their length. The first joint is shorter and broader than the rest; the second is the longest, being almost one-third the whole length of the palpus; third joint very short; fourth joint not quite as long as second. A ridge across the fourth joint makes it appear like two joints as viewed from above. The terminal joints diminish in order. The first six joints have very few hairs, while the terminal joints are thickly set with hairs about as long as the diameter of the fourth joint. The second joint is thickened at the ends but the other joints are not noticeably so thickened. The average diameter of the palpus is about one-half that of the chelifores. The ovigerous legs are nine-jointed; their diameter about half way between those of palpus and chelifores. The joints in order of length (except the first, which is short and broad), 4, 2, 5, 3, 6, 7, 8, 9. Legs are rather short and powerful with numerous, multi-spine-bearing, finger-like processes, especially on the coxa and two tibial joints. On the two tibial joints these processes are arranged in a double row down the back of the joint. The first and third coxal joint are sub-equal in length, the second one and one-half times as long. The femur is as long as the combined length of all three coxæ; the tibial joints two-thirds as long as the femur and but slightly longer than the tarsus. The claw is over three-quarters the length of tarsus, folding down between two rows of stout spines on tarsus. No auxiliary claws. Genital openings not apparent. Color light straw. Measurements in mm.: Proboscis 1.424; body 1.2; abdomen 1.1; leg 6.35; diameter of lateral processes .5.

This single specimen was swept from fucus in July and when taken, was so covered with litter which was imbedded among the spines, that no idea of the real aspect of the creature could be obtained until after boiling in KOH. This litter rendered it very hard to find among bits of fucus even when we knew it was there and its

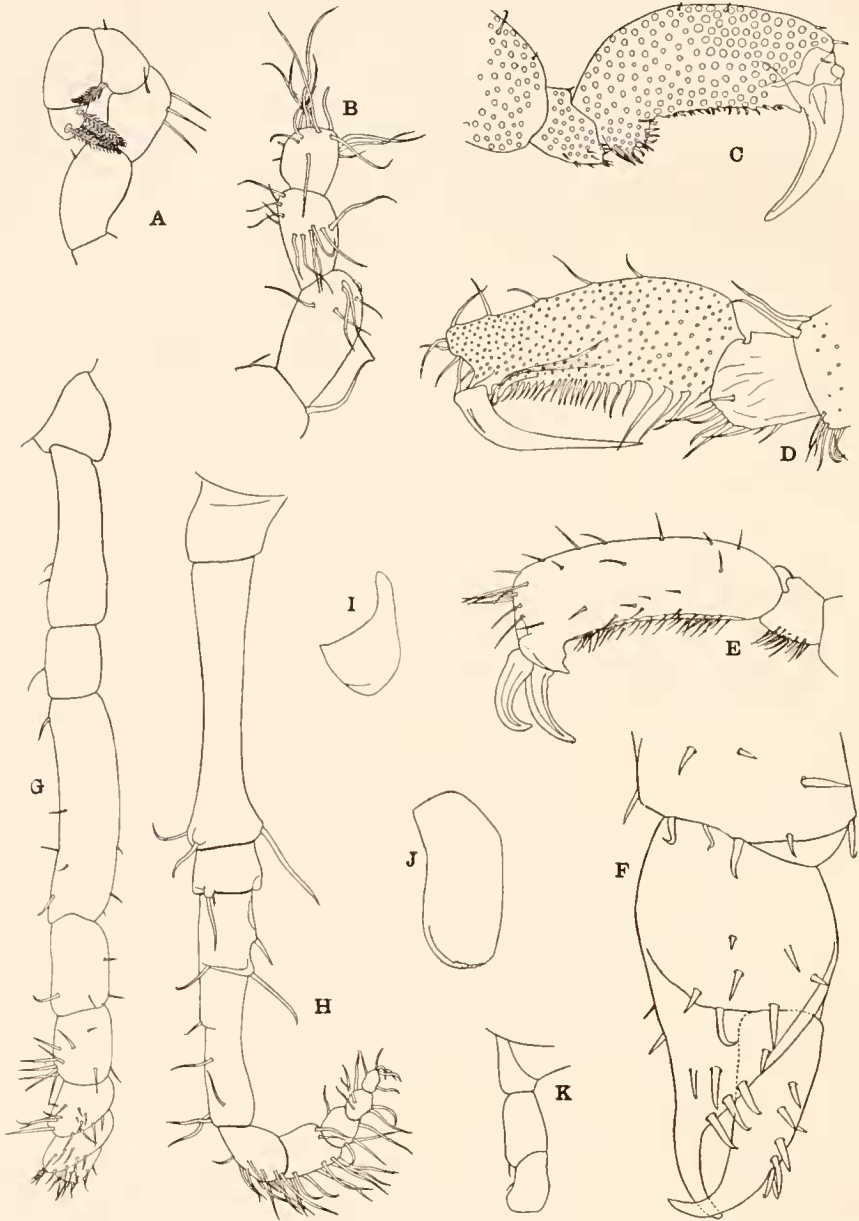


Figure 52. A, *Ammothella bi-unguiculata californica*, terminal joints of ovigerous leg. B, *Ammothella spinosissima*, terminal joints of ovigerous leg. C, *Anoplodactylus californicus*, tarsus. D, *Ammothella spinosissima*, tarsus. E, *Ammothella bi-unguiculata californica*, chelifere-terminal joints. F, *Anoplodactylus californicus*, chelifere-terminal joints. G, *Ammothella bi-unguiculata californica*, palpus. H, *Ammothella spinosissima*, palpus. I, *Anoplodactylus californicus*, palpus. J, *Anoplodactylus californicus*, ovigerous leg. K, *Ammothella bi-unguiculata*, chelifere.

discovery in the towings was almost accidental. We spent much time looking for others but with no success. The spine-bearing processes with which this species is covered serve to distinguish it from all other species of the genus.

In placing these last two species in *Ammothella*, I have followed Cole, who raised the sub-genus *Ammothella* (*Ammothea*—part), of Verrill, to generic rank because of the trunk being “usually proportionately broader and distinctly segmented, the chelifori three-jointed, and the palpi nine-jointed.” I hope that this brief explanation will show why they are not *Ammothea* proper, and avoid confusion. The multi-spine bearing processes on *A. spinosissima* may remind one of those on a *Nymphopsis* figured by Loman, Plate XIII of *Siboga-Expeditie XI*, but the arrangement of these processes, as well as generic characters, show that there can be no possible connection.